

1 **CLAIMS**

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3 I Claim:

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5 1. An optical stitch regulator system, comprising:
6 a sewing machine; and
7 at least one optical sensor attached to said sewing machine for measuring a
8 movement of a piece of fabric relative to a needle of said sewing machine, wherein said
9 optical sensor is in communication with said sewing machine regarding said movement.
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12 2. The optical stitch regulator system of Claim 1, wherein said optical sensor is
13 positioned within a sewing platform of said sewing machine.
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16 3. The optical stitch regulator system of Claim 2, wherein said optical sensor is
17 directed substantially upwardly.
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20 4. The optical stitch regulator system of Claim 1, wherein said optical sensor is
21 capable of sensing more than one axis of movement.
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24 5. The optical stitch regulator system of Claim 1, wherein said optical sensor is
25 capable of measuring a direction of said movement.
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28 6. The optical stitch regulator system of Claim 1, wherein said optical sensor is
29 capable of measuring a velocity of said movement.

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7. The optical stitch regulator system of Claim 1, wherein said optical sensor is positioned near said needle of said sewing machine.

8. The optical stitch regulator system of Claim 1, wherein said optical sensor is positioned in front of said needle of said sewing machine.

9. The optical stitch regulator system of Claim 1, wherein said optical sensor is capable of measuring a direction and a velocity of said movement.

10. The optical stitch regulator system of Claim 1, wherein said sewing machine controls the sewing operation based upon said movement for producing consistent stitches.

11. The optical stitch regulator system of Claim 1, including a control unit in communication between said optical sensor and said sewing machine, wherein said control unit is comprised of a motion interpretation module that transmits movement information to said sewing machine.

12. The optical stitch regulator system of Claim 1, wherein said optical sensor is directed downwardly.

1 13. The optical stitch regulator system of Claim 12, including a support member
2 attached to said sewing machine and supporting said optical sensor.

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5 14. The optical stitch regulator system of Claim 13, including an attachment
6 member that attaches said support member to said upper portion of said sewing
7 machine.

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10 15. The optical stitch regulator system of Claim 1, wherein said optical sensor
11 is comprised of a light source and a light receiver, wherein said light receiver detects
12 light reflected by a piece of fabric.

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15 16. The optical stitch regulator system of Claim 15, wherein said light source is
16 a light emitting diode.

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19 17. The optical stitch regulator system of Claim 1, wherein said light sensor is
20 positioned within a sewing platform of said sewing machine and wherein said light
21 sensor extends above an upper surface of said sewing platform.

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24 18. A process of operating an optical stitch regulator for a sewing machine, said
25 process comprising:

26 sensing a movement of fabric relative to a needle of a sewing machine with at
27 least one optical sensor;

28 generating a movement data representing said movement; and

1 adjusting a motor speed within said sewing machine based upon said movement
2 data.
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5 19. An optical stitch regulator system, comprising:
6 a sewing machine carriage; and
7 at least one optical sensor attached to said sewing machine carriage for
8 measuring a movement of a piece of fabric relative to a needle of a sewing machine,
9 wherein said optical sensor is capable of communicating with a sewing machine
10 regarding said movement.